

HR-170 Maintenance of Pavement Skid Resistance

Key Words: Friction, Highway safety, Aggregate, Seal coat

ABSTRACT

Dry pavements seldom offer inadequate skid resistance to a rolling or sliding motor vehicle tire. The formation of a film of water between the tire and pavement surface dramatically changes the physical interaction that normally takes place. Even greater chances take place when the vehicle is required to make significant adjustments in direction or speed. This report documents the Iowa Department of Transportation's activity on a project designed to evaluate one type of asphalt pavement surface that has, on occasion, shown that it can provide superior skid resistance when wet. When first developed, this surface was called "Plant Mix Seal Coat" because of its resemblance to chip seals commonly in use; through development and usage it has been renamed "Open Graded Asphalt Friction Course".

Previous studies have shown that the characteristics of the aggregate and the design of the mix determine the skid resistance and structural performance of Open Graded Asphalt Friction Course mixes. Generally, aggregate selection for other types of pavement and uses is heavily influenced by availability and cost. Since the quantities of aggregate are significantly reduced through Open Graded Asphalt Friction Course construction, problems associated with long distance shipping costs could be justified on at least some high priority safety projects if this type of construction proves to be sufficiently superior. The major objectives of this project involve the evaluation of Open Graded Asphalt Friction Courses using the spectrum of aggregates available to the Iowa Department of Transportation, and certain mix design parameters.

The following conclusions are based on the performance observed on this project.

1. Open Graded Asphalt Friction Courses can be satisfactorily constructed on and bonded to old portland cement concrete and asphalt concrete bases.
2. The primary distress parameter after 20 months of service is surface raveling over and adjacent to virtually all reflection cracks.
3. Crack raveling will require early maintenance, reduce the effective service life significantly, and detracts from the otherwise satisfactory appearance.
4. Within the range of asphalt contents used on this project, these mixes do not appear to be sensitive to asphalt content. The performance of all of the test sections indicates that future mix designs should exhibit characteristics comparable to the 6.25% Asphalt Content mixes.

5.
Crack raveling does not appear to be affected by asphalt content or aggregate type.

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